

Zurich Research Laboratory Intellectual Property Law

LAPIGACCICATATA 05 DEC 2005

In response to the Written Opinion of the International Search Authority

In view of the first Written Opinion dated 13 October 2004, the Applicant submits the observations below and an amended claim set comprising claims 1-13.

For the avoidance of doubt, the amendments are submitted without prejudice and without abandonment of subject matter.

The present invention discloses a method for forming a pattern on a surface by deposition of a melted mixture that comprises an application material and a phase-change transfer material. The mixture solidifies instantaneously on reaching the surface and the transfer material is subsequently removed by sublimation. Claim 1 (and similarly claims 5 and 12) has been amended to specify that the method of removal of the transfer material is sublimation. Support is found at claim 3 of the application as originally filed.

In contrast, neither D1 nor D5 describes removal of the transfer material by sublimation. In D1 an oxidation process to fuse the ink to the substrate is described in paragraph [0064]. D5 only describes an oxidation process ("...rapid firing cycle..." and "...burnout the solvent..."). Therefore, the applicant submits that independent claims 1 and 6 as amended are novel over the cited art.

It is noted by the Applicant that the constituents of the phase change ink of D1 and its subsequent applications are of an entirely different order of magnitude from the present invention. In the present invention, the application material comprises molecules and/or oligomers and/or nanoparticles which typically have dimensions of 1-20nm. The OLEDs formed from several layers of deposited composition, as illustrated in figures 2a and 2b, typically have a total depth of 100nm - 200nm. In contrast, the individual ceramic pigment particles in the ink of D1 have typical minimum dimensions of 100nm - 200nm (Table 4). Further, the intended use of the ink is for decorating ceramic and glass tableware or ornamental ware (paragraph [0051].

Composition claim 7 has been amended to include the subject matter of previous claim 9 and thus, the applicant submits that independent claim 7 as amended is novel over the cited art.

With reference to item 3.1 of the report, the Applicant submits that a person skilled in organic electronics who wants to produce an OLED using a solid ink printing technique as proposed in D2, when conducting a diligent search of the known art would find neither D1 nor D5. These documents are not in the field of organic electronics or the deposition technologies developed for small molecules.

Even if the skilled man were aware of these documents, he would note that D2 teaches silicon and organic electronics as incompatible alternatives "...interest in organic electronics...end of silicon..." (page 4, first paragraph) and so he would dismiss the teachings in "Hot melt ink technology for crystalline silicon solar cells", D5. Further, the skilled man would not consider the teachings of D1 because of the different order of magnitude of the process and composition elements described, and there is nothing in D1 which suggests that the technique disclosed would be suitable for using with small molecules.

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Finally, if, as examiner suggests, the skilled man were to combine the technologies of D2 and D1 or D5 in an endeavour to produce an OLED, the resultant process would not be similar to the process of independent claim 5 which requires 'removing the transfer material (24) by sublimation whereby the organic material (22) remains on the surface'. None of the cited documents disclose the step of sublimation.

Therefore, the subject matter of amended claims 1 and 5 involves an inventive step over the combination of D2 and D1 and also the combination of D2 and D5.

Claim 12 (previous claim 14) has been amended to specify that the transfer material is removed by sublimation. Support is found throughout the description.

Referring to item 3.2 of the report, the Applicant submits that a person skilled in organic electronics who wants to produce an FET using a solid ink printing technique as proposed in D3, when conducting a diligent search of the known art would find neither D1 nor D5. As previously explained, these documents are not in the field of organic electronics or the deposition technologies developed for small molecules.

Again, if the skilled man were to combine the technologies of D3 and D1 or D5 in an attempt to produce an FET, the resultant process would not be similar to the process of independent claim 12 which requires 'removing the transfer material (24) by sublimation whereby the organic material (22) remains on the surface'. None of the cited documents disclose the step of sublimation.

Therefore, the subject matter of amended claim 12 involves an inventive step over the combination of D3 and D1 or D5.

For the Examiner's convenience only, an additional claim set is provided to indicate changes that have been made. Those words or phrases that have been introduced into the claims are underlined, whereas words or phrases that have been deleted are marked as strike-through.

However, should the Examiner, intend to issue a negative IPER, he should not hesitate to call the representative on 0041 44 724 8422 if a telephone conversation may be useful to discuss further amendment.